

COMBINED TRANSMITTAL OF APPEAL BRIEF TO THE BOARD OF PATENT
APPEALS AND INTERFERENCES & PETITION FOR EXTENSION OF TIME
UNDER 37 C.F.R. 1.136(a) (Large Entity)

Docket No.
2701

In Re Application Of: BARTSCH, R,

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/625,582	07/23/2003	DEGHAN, Q.S.	278	1791	7748

Invention: METHOD FOR PREVENTING CONTAMINATION OF AN INNER SURFACE...

COMMISSIONER FOR PATENTS:

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Invention: METHOD FOR PREVENTING CONTAMINATION OF AN INNER SURFACE...

TO THE COMMISSIONER FOR PATENTS:

This combined Transmittal of Appeal Brief to the Board of Patent Appeals and Interferences and petition for extension of time under 37 CFR 1.136(a) is respectfully submitted by the undersigned:


Signature
Dated: OCTOBER 24, 2008

MICHAEL J. STRIKER
REG. NO.: 27233
ATTORNEY FOR THE APPLICANT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Q. S. DEGHAN; Art Unit: 1791; Docket No.: 2701

In RE: Application of Reiner BARTSCH

Ser. No.: 10/625,582

Filing Date: July 23, 2003

**Title: METHOD FOR PREVENTING CONTAMINATION OF AN
INNER SURFACE OF A HOLLOW GLASS BODY BY
ALKALI COMPOUNDS AND GLASS CONTAINER,
ESPECIALLY FOR MEDICINAL PURPOSES**

October 21, 2008

APPEAL BRIEF

Hon. Commissioner of Patents
and Trademarks,
Washington, D.C. 20231

Sir:

In response to the final Office Action issued on May 28, 2008 and the advisory action dated March 25, 2008, please consider the following arguments for overturning the rejections of the pending claims of the above-identified U.S. Patent Application:

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I. REAL PARTY IN INTEREST

The real party in interest is SCHOTT AG, which owns 100 % of the above-identified U.S. Patent Application.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

III. STATUS OF THE CLAIMS

1. Method claims 1 to 10 were canceled.
2. Glass container claims 11 to 16 were withdrawn from consideration, but have not been canceled.
3. Method claims 17 to 31 have been canceled.
4. Claims 32 to 46 have been rejected on various grounds and are the claims on appeal, i.e. the rejections of claims 32 to 46 are being appealed.
5. Claims 32 to 46 stand rejected under 35 U.S.C. 112, first paragraph, for failing to comply with the written description requirement.
6. Claims 32 to 39 and 41 to 46 stand rejected under 35 U.S.C. 112, second paragraph, for indefiniteness.
7. Claims 32 to 35 and 40 to 41 stand rejected as unpatentable under 35 U.S.C. 103 (a) over Ritt, et al (US 4,516,998), in view of Bennett, et al (US 3,985,535).
8. Claims 36 to 39 and 42 stand rejected as unpatentable under 35 U.S.C. 103 (a)

over Ritt, et al (US 4,516,998), in view of Bennett, et al (US 3,985,535), and Schul (US 4,010,022).

9. Claims 43 and 44 stand rejected as unpatentable under 35 U.S.C. 103 (a) over Ritt, et al (US 4,516,998), in view of Ott, et al (US Published Patent Application 2004/0176237).

10. Claims 45 and 46 stand rejected as unpatentable under 35 U.S.C. 103 (a) over Ritt, et al (US 4,516,998), in view of Ott, et al (US Published Patent Application 2004/0176237) and Schul (US 4,010,022).

IV. STATUS OF THE AMENDMENT AFTER FINAL ACTION

1. No amendments after final action or requests for reconsideration were filed subsequent to the issuance of the final Office Action issued May 28, 2008.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The page and line numbers in the following summary of the claimed subject matter refer to the location of that subject matter in the appellant's specification.

A. INDEPENDENT METHOD CLAIMS 32 AND 43

Independent method claims 32 and 43 differ only because the method of making the glass container of method claim 32 is limited to any glass that releases alkali during thermal processing, whereas claim 43 is limited to a glass with the following composition: SiO₂, 75; B₂O₃, 10.5; Al₂O₃, 5; Na₂O, 7; CaO, 1.5; and BaO, << 1. Quantitative measurements of the alkali release from the glass bottle made with this glass composition, when the method of claims 43 is performed, are described in the single paragraph between page 9, line 14, and page 10, line 2, of the appellant's originally filed specification.

The wording in the appellant's specification, which supports the wording of claim 32, is found on page 5, lines 2 to 10, and is as follows:

*a method comprising the steps of:

- a) thermally cutting a glass tube to length;
- b) thermally opening a bottom formed on the glass tube during the cutting to length;
- and
- c) providing an overpressure in an interior of the glass tube.

In order to attain the desired effect the overpressure must be provided during the thermal processing, since the alkali compounds evaporate during the thermal processing or at the time of the thermal processing."

The above method steps a to c recited on page 5 of the appellant's specification are included in method steps b to d of method claim 32 and method steps c to e of method claim 43, which state that the glass tube is thermally cut to length, that the bottom of the glass tube is thermally opened during the claimed method of making the glass container, and that an overpressure is provided by partially closing the open upper end of the hollow glass tube.

Step a of claim 32 and step b of claim 43 includes the following wording: "clamping a hollow glass tube with an open upper end and an inner surface in a vertical orientation". Figures 1 and 2 of appellant's specification each show a glass tube 2 with an open upper end clamped in a vertical position. Furthermore the detailed description on pages 8 and 9 of the specification discloses embodiments of the claimed method of making a glass container or small bottle that are illustrated in figures 1 and 2 (page 8, lines 4 to 6, of the specification). Step a of claim 32 and step b of claim 43 is explicitly supported by the disclosure at page 8, lines 6 to 7, and page 9, lines 1 to 4.

The method of claim 32 is explicitly limited to glass tubes that release alkali during thermally processing in step a of claim 32. That glass tubes release alkali during thermal processing is supported by page 2, lines 9 to 10, of the background section of appellant's specification. That the appellant's methods are for the purpose of reducing or avoiding contamination by alkali compounds during thermal processing is supported by page 4, lines 4 to 10, of the appellant's specification

during recitation of the objects of the invention. The appellant's methods are effective in reducing contamination of the inner surface is disclosed in the last paragraph on page 4 and the paragraph between page 9, line 14, and page 10, line 2, of the appellant's originally filed specification.

The step b of method claim 32 and step c of method claim 43 that state that the result of thermally cutting the hollow glass tube to length produces a tube piece for discard and a bottom of the hollow glass tube clamped in the vertical orientation in step a of these claims are supported by the disclosure on page 8, lines 8 to 10, which explains that two bottoms are formed by the "cutting through", namely an upper bottom on the clamped piece of the glass tube and a lower bottom (piece) which is discarded.

The critical overpressure in the glass tube during thermal processing is provided by a stopper with a through-going hole that partially closes the upper end of the glass tube in the case of the embodiments according to step d of claims 32 and 43. Fig. 2 supports this embodiment. The last two paragraphs on page 6 and the first paragraph on page 9 of the appellant's specification support the use of the stopper with the through-going hole to provide the overpressure. Page 9, lines 4 to 13, of the appellant's specification also support the feature that the size of the hole in the stopper is selected so that the overpressure is not too high and damage to the softened glass tube is prevented.

The independent claims, for example the last two lines of step d of claim 32 and of step e of claim 43, state that "thermal processing" includes "thermally cutting to length" and "thermally opening the bottom" (i.e. steps a and step b of claim 32

and steps b and c of claim 43). The specification defines "thermally processing" at page 2, lines 20 to 23, as "after-working" (which of course must involve heating since the after-working is "thermal") in order to process the "intermediate product", i.e. the glass tube, to make the "end product", i.e. the glass bottle. Since thermally "cutting to length" and "thermally opening" of the glass tube occur after the glass tube ("intermediate product") is made, this definition supports the wording in the claims that states that "thermal processing" includes "thermally cutting to length" and "thermally opening the bottom".

Especially note the last paragraph on page 4 and the paragraph between page 9, line 14, and page 10, line 2 that support the stated result of the claimed methods of making a small glass container recited in the last paragraphs of independent method claims 32 and 43, namely that the contamination of the inner surface of the tube by alkali release is reduced.

B. INDEPENDENT METHOD CLAIMS 36 AND 45

Independent method claims 36 and 45 differ from each other only because the method of making the glass container of method claim 36 covers any glass that has a composition such that alkali is released during thermal processing, whereas method claim 45 is limited to a glass with the following composition: SiO₂, 75; B₂O₃, 10.5; Al₂O₃, 5; Na₂O, 7; CaO, 1.5; and BaO, << 1. Quantitative measurements of the alkali release from a glass bottle made with this glass, when the method of

claim 45 is performed, are described in the single paragraph between page 9, line 14, to page 10, line 2, of the appellant's originally filed specification.

Furthermore the method covered by independent method claim 36 differs from the method covered by the above-described independent method claim 32 only in that the overpressure provided in the steps d) of the respective methods is provided in a different manner. The same is true of the independent method claim 45 and the above-described independent method claim 43. Otherwise the subject matter and the support for these respective pairs of method claims is the same.

Nevertheless for the convenience of the examination of this appeal brief the support for the various steps of claims 36 and 45 in the specification is again pointed out in this section specifically for claims 36 and 45.

The wording in the appellant's specification on page 5, lines 2 to 10, which supports the wording of claim 36, is found on page 5, lines 2 to 10 and is as follows:

"a method comprising the steps of:

- a) thermally cutting a glass tube to length;
- b) thermally opening a bottom formed on the glass tube during the cutting to length;
- and
- c) providing an overpressure in an interior of the glass tube.

In order to attain the desired effect the overpressure must be provided during the thermal processing, since the alkali compounds evaporate during the thermal processing or at the time of the thermal processing."

The above method steps a to c recited on page 5 of the appellant's specification are included in method steps b to d of method claim 36 and in method steps c to e of method claim 45, which state that the glass tube is thermally cut to

length, that the bottom of the glass tube is thermally opened during the claimed method of making the glass container, and that an overpressure is provided by blowing gas into the clamped glass tube through its open upper end of the hollow glass tube.

Step a of claim 36 and step b of claim 45 includes the following wording: "clamping a hollow glass tube with an open upper end and an inner surface in a vertical orientation". Figures 1 and 2 of appellant's specification each show a glass tube 2 with an open upper end clamped in a vertical position. Furthermore the detailed description on pages 8 and 9 of the specification discloses embodiments of the claimed method of making a glass container or small bottle that are illustrated in figures 1 and 2 (page 8, lines 4 to 6, of the specification). Step a) of claim 32 and step b) of claim 43 is explicitly supported by the disclosure at page 8, lines 6 to 7, and page 8, lines 18 to 20.

The method of claim 36 is explicitly limited to glass tubes that release alkali during thermally processing in step a of claim 36. That glass tubes release alkali during thermal processing is supported by page 2, lines 9 to 10, of the background section of appellant's specification. That the appellant's methods for the purpose of reducing or avoiding contamination by alkali compounds during thermal processing is supported by page 4, lines 4 to 10, of the appellant's specification during recitation of the objects of the invention. The appellant's methods are effective in reducing contamination of the inner surface is disclosed in the last paragraph on page 4 and the paragraph between page 9, line 14, and page 10, line 2, of the appellant's originally filed specification.

The step b of method claim 36 and step c of method claim 45 that state that the result of thermally cutting the hollow glass tube to length produces a tube piece for discard and a bottom of the hollow glass tube clamped in the vertical orientation in step a) of these claims are supported by the disclosure on page 8, lines 8 to 10, which explains that two bottoms are formed by the "cutting through", namely an upper bottom on the clamped piece of the glass tube and a lower bottom (piece) which is discarded.

The critical overpressure in the glass tube during thermal processing is provided by blowing gas into the hollow glass tube through its open upper end in the case of the alternative embodiments according to step d) of claims 36 and 45 (which is the primary difference between the aforesaid claims and claims 32 and 43). Fig. 1 supports this embodiment. The last paragraph on page 5 of the appellant's US specification supports providing the overpressure by blowing a gas into the hollow glass tube at the end opposite the end where the thermal processing takes place. Page 8, lines 18 to last line, and fig. 1 of the appellant's specification support the limitation that the limitation that the gas flow is conducted into the glass tube through its open upper end.

The independent claims state that "thermal processing" includes "thermally cutting to length" and "thermally opening the bottom" (formed in step b). The specification defines "thermally processing" at page 2, lines 20 to 23, as after-working steps (which of course must involve heating since they are thermal) for processing the "intermediate product", i.e. the glass tube, to make the "end

product", i.e. the glass bottle. Since thermally "cutting to length" and "thermally opening" occur after the glass tube is made and to the glass tube, this definition supports the wording in the claims that states that "thermal processing" includes "thermally cutting to length" and "thermally opening the bottom".

Especially note the last paragraph on page 4 of the specification that discloses quantitative alkali release results for alkali release. This statement supports the stated result of the claimed method of making a small glass container in the last paragraphs of claims 36 and 45.

C. INDEPENDENT CLAIMS 40 AND 42

Independent claims 40 and 42 are similar to claims 32 and 36 because they are not limited to a glass of a particular chemical composition. These claims cover a method of reducing contamination of an inner surface of a hollow glass tube by alkali release during thermal processing instead of a method of making a glass container.

Except for the fact that independent claim 40 does not include the steps of "thermally cutting to length" and "thermally opening", claims 40 and 42 only differ from claims 32 and 36 respectively in their preambles.

The preambles of both claims 40 and 42 claim a method of reducing contamination on the inner surface of a glass tube due to alkali release during thermal processing that includes the same basic steps as claims 32 and 36 respectively. The wording in these preambles is supported by page 4, lines 7 to 10,

of the appellant's specification. Also see the specific statements in the last paragraph on page 8 of the appellant's specification.

Nevertheless for the convenience of the examination of this appeal brief the specific support for the various steps of claims 40 and 42 in the specification is again pointed out in this section specifically for claims 40 and 42.

Step b) of claim 40 and step d) of claim 42 include the step of producing the required overpressure in the hollow glass tube. Page 4, lines 15 to 17, of the appellant's specification provide general support for the step of thermally processing a hollow glass body (such as a glass tube) so that an overpressure is provided in the interior of the hollow glass body. Furthermore page 4, lines 18 to 21, state that a glass container made by thermally processing with the overpressure will have a smaller alkali release from the inner surface of the glass container. Support is also provided by page 5, lines 16 to 19, of the appellant's specification.

In the case of claim 40, step b, the overpressure is provided by partially closing or constricting the open upper end of the glass tube with a stopper provided with a through-going hole. Fig. 2 of appellant's specification supports this embodiment. The last two paragraphs on page 6 of the appellant's US specification support the use of the stopper with the through-going hole to provide the overpressure, as claimed in step b of claim 40. Page 9, lines 4 to 13, of the appellant's specification also support the feature that the size of the hole in the

stopper is selected so that the overpressure is not too high and damage to the softened glass tube is prevented.

In the case of claim 42, step d, the overpressure is provided by blowing gas into the hollow glass tube through its open upper end in the case of the alternative embodiments according to step d) of claims 36 and 45 (which is the primary difference between claims 32 and 43). Fig. 1 of appellant's specification supports this embodiment. The last paragraph on page 5 of the appellant's US specification supports providing the overpressure by flowing a gas into the hollow glass tube at the end opposite the end where the thermal processing takes place. Page 8, lines 18 to last line, and fig. 1 of the appellant's specification support the limitation that the limitation that the gas flow is conducted into the glass tube through its open upper end.

Step a of claims 40 and 42 includes "clamping a hollow glass tube with an open upper end and an inner surface in a vertical orientation". Figures 1 and 2 show the glass tube 2 clamped in a vertical position. Both figures 1 and 2 show that the upper end of the glass tube 2 is open. Furthermore the detailed description on pages 8 and 9 of the specification describes a method of making a glass container or small bottle that is illustrated in figures 1 and 2 (page 8, lines 4 to 6, of the specification). Furthermore step a is explicitly supported by the disclosure at page 8, lines 6 to 7.

The steps b and c of thermally cutting and thermally opening of claim 42 are supported by the disclosures in the first paragraph on page 5 of the appellant's specification.

The independent claims state that "thermal processing" includes "thermally cutting to length" and "thermally opening the bottom" (formed in step b). The specification defines "thermally processing" at page 2, lines 20 to 23, as after-working steps (which of course must involve heating since they are thermal) for processing the "intermediate product", i.e. the glass tube, to make the "end product", i.e. the glass bottle. Since thermally "cutting to length" and "thermally opening" occur after the glass tube is made and to the glass tube, this definition supports the wording in the claims that states that "thermal processing" includes "thermally cutting to length" and "thermally opening the bottom".

Especially note the last paragraph on page 4 of the specification that discloses quantitative alkali release results for alkali release. This statement supports the stated result of the claimed method.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

(1) Whether claims 32 to 46 fail to comply with the written description requirement under 35 U.S.C. 112, first paragraph.

(2) Whether claims 32 to 39 and 41 to 46 fail to particularly point out and distinctly claim the subject matter of the invention as required by 35 U.S.C. 112, second paragraph.

(3) Whether claims 32 to 35 and 40 to 41 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al (US 4,516,998), in view of Bennett, et al (US 3,985,535).

(4) Whether claims 36 to 39 and 42 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al (US 4,516,998), in view of Bennett, et al (US 3,985,535), and Schul (US 4,010,022).

(5) Whether claims 43 and 44 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al (US 4,516,998), in view of Ott, et al (US Published Patent Application 2004/0176237).

(6) Whether claims 45 and 46 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al (US 4,516,998), in view of Ott, et al (US Published Patent Application 2004/0176237) and Schul (US 4,010,022).

VII. ARGUMENTATION

Argumentation to show that the aforesaid rejections of the various claims should be overturned is presented in this section. Each ground of rejection is considered separately.

A. REJECTION OF CLAIMS 32 to 46 UNDER 35 U.S.C. 112, 1ST ¶

The issue considered in this part of the argumentation section is whether claims 32 to 46 do or do not have adequate support in the disclosures of the originally filed application.

Page 2 of the final Office Action states that the reason for the rejection of claims 32 to 46 for failing to comply with the written description requirement is that the appellant's specification only states that thermal processing includes thermally opening the bottom of the glass tube, but does not state that thermal processing includes thermally cutting the glass tube to length.

Furthermore paragraph 19 on page 11 in the "Response to Arguments" in the Office Action states that support needs to be explicit and that what would be apparent to one of ordinary skill in the art is not explicit support, but this is not exactly the standard for sufficiency of the written description for amended claims that have been amended to include new limitations. That standard is set forth in correct according to M.P.E.P. 2163.02:

"The test for sufficiency of support in a patent application is whether the disclosure of the application relied upon 'reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter.' " *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985).... (Fed. Cir. 1983))".

Thus there is no requirement for explicit support if explicit support means word-for-word support in the specification for the wording of an amended claim.

Even in the case of new matter rejections word-for-word support is not required. For example, rephrasing of a passage of a claim that appears in a specification and changing the wording in the specification, i.e. changing the word order, by an amendment does not constitute "new matter" and a failure to comply with the written description requirement according to M.P.E.P. 2163.07.

It is respectfully submitted that the appellant's specification does provide support for stating that "thermal processing" comprises thermally cutting to length.

For example the specification on page 2, lines 20 to 23, clearly states that:

"The thermal processing steps can be understood in the sense of after-working, since this method amounts to after-working of a finished rigid glass intermediate product for manufacture of the end product, i.e. the glass tube or tubing."

In other words, any processing using heat, i.e. 'thermally processing', of the glass tube that takes place after the glass tube is produced for the purpose of making an end product, such as the glass container, is a thermally processing step. Since the thermally cutting to length occurs after the glass tube is produced in

order to make the glass container, it is an example of the thermally processing steps according the last paragraph on page 2 of the appellant's specification.

Furthermore the term "processing" would be understood by one of ordinary skill in the art to include opening and closing a bottom of the tube. Indeed "cutting to length" is a specific example of processing the glass tube. The "cutting to length" does not need to be performed by application of heat e.g. from a gas burner. However page 5, lines 4 - 5, of appellant's specification states that the thermally opening occurs during the thermally cutting to length. Thus both thermally cutting to length and thermally opening are thermally processing steps that can occur at the same time by application of heat, e.g. from a burner. Also one skilled in the art would recognize that "*thermally* cutting to length" is an example of "*thermally* processing".

For the foregoing reasons Honorable Board of Patent Appeals and Interferences is respectfully requested to overturn the rejection of claims 32 to 46 for failing to comply with the written description requirement under 35 U.S.C. 112, first paragraph.

B. REJECTION OF CLAIMS 32 to 46 UNDER 35 U.S.C. 112, 2nd ¶

The issue considered in this part of the argumentation section is whether claims 32 to 39 and 41 to 46 fail to particularly point out and distinctly claim the subject matter that the appellant considers to be his invention. In other words, the issue is whether or not these claims are indefinite.

Page 3 of the Office Action states that the essential omitted step in the appellant's claims was a linking step between forming a bottom on the glass tube clamped in the vertical orientation in step b) and the opening of the bottom in step c). Page 3, line 2, seemingly implies that the omitted step the closing of the bottom formed in step b).

Appellant respectfully disagrees because a bottom of a clamped tube does not need to be completely closed to be opened. An example of this sort of 'opening' is a heating step in which the bottom is heated and flared with a flaring tool to form the upper end of a glass vase. Another example is a heating operation in which the bottom that has a small pin hole is opened up.

Furthermore the claims do not state that the bottom is not closed.

The appellant's specification on page 8, line 8 merely states that "two bottoms" are formed. The "upper bottom" mentioned on page 8, line 10, is the "bottom" of e.g. claim 32, step b). At that point in the specification the exemplary embodiment states that the upper bottom is opened by means of the jet flame (i.e. thermally) and that a mouth of the container is formed. It is noted in relation to the above example of a bottom that has an opening that is later widened, as is well known in the art it is not uncommon for a glass container to have a flared mouth, e.g. a vase.

Therefore the independent claims do not have missing essential steps. The critical essential step of the claimed method involves the production of the overpressure in the glass tube during thermal processing and is present in all independent claims.

For the foregoing reasons Honorable Board of Patent Appeals and Interferences is respectfully requested to overturn the rejection of claims 32 to 39 and 41 to 46 under 35 U.S.C. 112, second paragraph, for indefiniteness.

C. CLAIMS 32 to 35 AND 40 to 41

The issue considered in this part of the argumentation section is whether or not claims 32 to 35 and 40 to 41 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al, (referred to as "Ritt" herein below), in view of Bennett, et al (referred to as "Bennett" herein below).

The recited order of the steps in the method claims obscures to some extent the limitation that is present in step d of claim 32 and step b of claim 40 that the overpressure produced by partially closing the open upper end of the hollow glass tube with the stopper is present during thermal processing. This limitation is supported by the disclosure in appellant's specification on page 4, lines 16 to 17. Both claims continue to define "thermal processing" as including thermally cutting to length and thermally opening.

In the event that this latter limitation continues to be rejected under 35 U.S.C. 112, first paragraph, it should be considered under 35 U.S.C. 103. All limitations that are present in a method claim must be considered during examination of the method claim under 35 U.S.C. 103 (a), e.g. limitations that are indefinite, according to M.P.E.P. 2143.03.

Thus the limitation that an overpressure is produced by partially closing an open upper end of the hollow glass tube with a stopper *during thermal processing* should be considered according to M.P.E.P. 2143.03.

According to appellant's claim 32 and claim 40 the stopper in the upper opening of the glass tube produces the overpressure when thermal processing is taking place.

Ritt discloses a method in which the glass tubes are sealed at both ends prior to making the vial or ampoule by cutting through with a gas burner at (column 2, lines 30 to 39). Both independent method claims 1 and 6 of Ritt disclose a method starting with a glass tube that is closed at both ends. Ritt discloses no other method for making the starting glass tube that is closed at both ends except for thermally cutting a section of glass tubing by means of a gas jet or gas burner.

The process of making the glass tube that is closed at both ends by severing it from glass tubing stock results in the evaporation of alkali from the interior surface of the glass tube and deposition of the alkali on the interior surface of the glass tube that is the intermediate product that is the starting point for the claimed method of Ritt according to the disclosure in the second paragraph on page 2 of the appellant's specification. The evaporation would continue in the glass tube after the hot closed ends are formed while the glass tube is cooling. Furthermore the making of the intermediate tube product that is the starting point for their method occurs by "thermal processing" in accordance with appellant's definition of "thermal processing".

In contrast, appellant's claims 32 and 40 are limited to a method in which a **stopper** is inserted in an open upper end of the glass tube while "thermal processing" takes place. Ritt fails to disclose that a stopper is present in the glass tube from glass tubing stock while the starting glass tube is cut from the glass tubing stock using the gas burners according to column 2, lines 30 to 39.

Furthermore the claimed methods of claims 1 and 6 of Ritt include the step of heating a portion of the starting glass tube that has both ends closed at one end of the glass tube to form a dot-shaped opening with a jet flame according to column 2, lines 40 to 45. The dot-shaped opening would act as a constriction during thermal processing. However Ritt fails to disclose that a stopper is placed in the dot-shaped opening for the purposes of creating a greater overpressure in the tube with the dot-shaped opening, as claimed in appellant's claims 32 and 40. Ritt does provide some guidance regarding the size of the opening, which can be as large as 1.5 mm, but it is not inconceivable that a stopper could not be designed and produced to fit in a circular opening of this size by modern fabrication techniques. Furthermore neither the prior art reference nor Ritt including size limitations for the dot-shaped opening or the upper open end of the glass tube in their claims.

Thus the step of partially closing by inserting the stopper according to step d of claim 32 and step e of claim 40 is completely absent from the disclosure of Ritt.

Previously the US Patent of Leber was combined with the other prior art references including Ritt to reject the claimed method that utilizes the stopper as obvious. However argumentation was filed and the rejection based on the prior art including Leber was withdrawn, but no other prior art reference has been cited in

the current rejections to cure the deficiencies due to the absence of a prior art reference that discloses a similar method that uses a stopper with a hole in it to provide an overpressure.

In addition, Ritt does disclose that the starting glass tube with the closed ends and the dot-shaped opening is thermally processed to form a bottom portion and that the excess pressure developed during formation of the bottom portion because of the dot-shaped opening causes the tube to burst open immediately forming a vial or bottle mouth according to claims 1 and 2 of Ritt. Again Ritt fails to disclose that a stopper is placed in the dot-shaped opening for the purposes of creating a greater overpressure in the tube with the dot-shaped opening, as claimed in appellant's claims 32 and 40.

There must be a sufficient reason articulate that explains why one skilled in the art would arrive at the claimed method of the appellant with all its limitations. For example, the Board of Appeals has previously said that:

"The Examiner has not articulated a sufficient reason why one skilled in the art would have modified [the art] and arrived at the presently claimed subject matter" *Ex Parte Penhasi*, BPAI Appeal No. 2007-2543 (Dec 13, 2007).

and overturned the rejection in the case of the cited appeal.

In the case of the presently claimed methods of claims 32 and 40 Ritt simply does not disclose a method in which a stopper with a hole is inserted an opening in the end of a glass tube during thermal processing for the purpose of producing an overpressure in the glass tube.

In addition, appellant is claiming a method and method limitations should not be discounted or ignored. Ritt does **not** disclose producing the overpressure with a stopper. Thus there is no reason that one skilled in the art would arrive at the appellant's use of the stopper to form the overpressure from the disclosures in Ritt. Instead Ritt teaches forming a small dot-shaped opening at the end of a tube that is closed at its opposite ends.

It is respectfully submitted that these two different methods of producing the overpressure are not equivalent to each other, as argued on page 5 of the final Office Action.

The use of the stopper according to claims 32 and 40 is especially advantageous because it does not require the expenditure of energy and the consumption of fuel to form the dot-shaped opening. Although the energy and fuel consumption may be comparatively small in the case of a single vial or bottle, the methods of Ritt and the appellant are repeated over and over again to make a large number of bottles or vials and thus a much greater amount of energy and fuel are consumed by forming the dot-shaped openings in a plurality of tube pieces in the method of Ritt than are produced by appellant's method using the stopper. Furthermore the stopper can be re-used many times for many bottles and vials prior to its replacement.

Thus there are great advantages to the appellant's method of claim 32, step d, and the method of claim 40, step b, in which a stopper is used to produce the overpressure instead of a dot-shaped opening in a glass tube piece with closed ends.

According to page 5, lines 2 to 6, of the **final** Office Action, the stopper is merely an equivalent means for sealing one end of a glass tube in order to produce an overpressure. Appellant respectfully disagrees because the stopper is not a means that is equivalent to forming a dot-shaped opening at one closed end of the glass tube piece, which should be apparent from the above considerations regarding the advantages of the stopper.

The test for equivalency under 35 U.S.C. 103 (a) for a means performing a certain function is set forth in M.P.E.P. 2185. Although this test is described in the M.P.E.P. for "means plus function" wording, it is helpful in the present context regarding a determination whether or not the method of producing the overpressure with the stopper of the appellant and the method of producing the overpressure with the dot-shaped opening of Ritt are equivalent. It is also similar to the test used by courts when the doctrine of equivalence is applied during claim construction.

The test of equivalency is that the element of the claim must perform the identical function in the same way to achieve the same results. Admittedly both the stopper and the dot-shaped opening perform the same function during thermal processing, i.e. producing an overpressure. However they do that in a different way to produce different results. The dot-shaped opening disappears during the processing of a single piece of glass tube to form a single vial or bottle, but the stopper can be used and re-used a large number of different times with different pieces of glass tube. The results are different because the step of producing the overpressure in the case of Ritt requires the formation of the dot-shaped opening

with a gas jet, which increases the costs, waste (due to incorrect formation of the dot-shaped opening) and energy consumption in the case of the process of Ritt, in comparison to a method of producing the overpressure by inserting the stopper in an open end of the glass tube.

Bennett does not cure the deficiencies of Ritt. Bennett is only cited on page 4 of the final Office Action to support the fact that glass vials and ampoules are made of aluminosilicate glass that contain alkali oxides. Certainly one skilled in the art would understand that deposition of alkali compounds is only a problem when the glass contains alkali oxides. Appellant's methods are limited to glass tubes having an alkali release during thermal processing in the steps a of claims 32 and 40.

Furthermore Bennett discloses making an ampoule by heating a glass tube open at both ends in the middle with a gas jet or torch so that the middle portions softens and then stretching the tube axially. The constricted middle portion is allowed to cool and then divided in the middle. Both pieces can now be cut to length and the discharge opening is ground with a grinding wheel to obtain the right sized opening. Bennett discloses this process in column 3, line 59, to column 4, line 10, and claims the process in claim 1.

During the thermal processing described in the above paragraph a stopper is not used according to Bennett. Also the end of the tube opposite to the end at which thermal processing (drawing and heating) is taking place is not constricted in any way. Claim 32 teaches that the constriction takes place at the end of the tube

opposite to the bottom that is thermally processed by opening with a gas jet or torch or the like.

Thus, in the case of the presently claimed methods of claims 32 to 35 and 40 to 42 the Office Action has not provided a sufficient reason that one skilled in the art would modify the combined disclosures of the Ritt and Bennett US Patents to obtain the appellant's claimed method in which a stopper is used to produce an overpressure in the tube during thermal processing of the end opposite to the stopper. In contrast, the methods of Ritt and Bennett do not employ a stopper inserted in an opening provided in the tube to increase the overpressure. Alternatively, the step of providing the overpressure by forming a dot-shaped small opening in one end of a tube with closed ends is not equivalent to the appellant's method of producing the overpressure by a stopper in the open upper end of a glass tube and thermally processing the other end (bottom).

Turning to the "Response to Arguments" on pages 11 to 12 of the final Office Action, paragraph 21 states that the stopper with the hole is not present during the cutting of the tube to length, which is a thermal processing step. Attention is called to the definition of thermal processing in the appellant's specification and page 4, lines 14 to 17, which state that the overpressure is produced in the appellant's method during thermal processing. Furthermore the disclosure on page 8, line 12, states that the tube 2 is "melted through" according to the "height of the bottle", which is the thermally cutting to length step (glass only

melts by application of heat). Thus one skilled in the glass arts would come to the conclusion that the stopper should be present during both the thermally cutting to length and thermally opening.

In addition, the disclosure on page 8, lines 14 to 15, of the appellant's specification teaches that the above method steps are repeated during subsequent processing to make another glass bottle from the same tube that is clamped in the carousel machine in a vertical orientation. One skilled in the art would understand that a single tube section is used to make a plurality of glass bottles and that the top of that tube section is shown in fig. 2 with the stopper inserted. After the stopper is inserted, then the process of making the first glass bottle would start in which the lower and upper bottoms are formed according to page 8, lines 8 to 12, by thermally cutting through the glass tube. Then the bottle is thermally cut to length after thermally opening the upper bottom. There would be no reason to remove the stopper and reinsert it again in the aforesaid tube section when the additional glass bottles are made from it.

Consequently the specification clearly and definitely supports the uses of the stopper to produce the overpressure in the tube during all phases of thermal processing to make glass bottles.

Paragraph 22 of the final Office Action states that the arguments in the amendment do not point out the limitations in the claims that distinguish their subject matter from the cited prior art. It is respectfully submitted that the distinguishing limitation in method claims 32 to 35 and 40 to 42 is the use of the stopper to produce an overpressure and that this method of producing the

overpressure during thermal processing is not obvious from the combined disclosure of Ritt and Bennet.

For the foregoing reasons Honorable Board of Patent Appeals and Interferences is respectfully requested to overturn the rejection of claims 32 to 35 and 40 to 41 as unpatentable under 35 U.S.C. 103 (a) over Ritt, et al, in view of Bennett, et al.

D. CLAIMS 36 to 39 AND 42

The issue considered in this part of the argumentation section is whether or not claims 36 to 39 and 42 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al, in view of Bennett, et al, and Schul.

The method claimed in independent claims 36 and 42 corresponds to that shown in fig. 1 in which air is blown into the upper opening of the tube section that is clamped vertically in the bottle making machine or carousel during thermal processing of the lower parts of the tube section. The upwardly rising heated air and the downwardly flowing air from a blower create the desired overpressure in the glass tube as it is being thermally processed as explained in the last paragraph on page 5 of the appellant's specification.

The disclosures of Ritt and Bennett have been discussed in the above section C in connection with the rejection of independent method claims 32 and 40 and that disclosure is incorporated in this section by explicit reference thereto.

Schul is cited in paragraph 11 of the final Office Action as teaching the limitation that the overpressure in the glass tube during thermal processing is

supplied by blowing air into the open upper end of the glass tube during thermal processing, which of course is not disclosed in either Ritt or Bennet.

Schul does disclose creating and maintaining an overpressure in a fused silica tube of Schul during thermal processing while heating and drawing the tube by "delivering a forming gas through line 11". Schul does not use the term "blowing".

It is respectfully submitted that one skilled in the glass arts would not combine the disclosures of Ritt and Bennett with the disclosures of Schul in the manner suggested in the Office Action.

One skilled in the arts only has the disclosures in the prior art as represented by the cited references, Ritt, Bennet, and Schul, available at the time the claimed invention was made. Knowledge that is gained from the appellant's specification cannot be combined under 35 U.S.C. 103 (a) with these prior art references to arrive at the claimed invention. For example, the Federal Courts have said:

"As in all determinations under 35 U.S.C. 103, the decision-maker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selected elements from references to fill the gaps". *In re Gorman*, 18 U.S.P.Q.2d 1885 (Fed. Cir. 1991).

One skilled in the art would not combine the disclosures of Schul with those of Ritt and Bennett because the introduction of forming gas in the silica tube of Schul is for an entirely different purpose and under completely different conditions

than the blowing of gas, specifically air in preferred embodiments disclosed in the specification, into a glass tube during the thermal processing steps in a method of making a glass bottle or vial.

Schul teaches nothing about a glass bottle or a vial or the steps of a method for making a glass bottle or a vial. Schul only discloses methods of making a fused silica tube of a calibrated diameter by heating and drawing a hollow cylinder of silica while maintaining an overpressure in the interior of the hollow cylinder 2 (column 2, lines 46 to 68).

Fused silica has a much higher melting point than normal glass, e.g. the aluminosilicate glass of Schul. Thus it is not obvious that features of the method of Schul for making silica tubes could be applied to the problem of improving the methods of making a glass bottle made of the aluminosilicate glass according to Bennett, which would have an alkali release.

Furthermore the overpressure produced in the silica tube is used for an entirely different purpose than the overpressure produced in the appellant's methods. The overpressure in the silica tube is for the purpose of producing a silica tube with the desired cylindrical shape and an accurate diameter. The magnitude of that overpressure would depend on the extent the high melting silica cylinder is softened and would not necessarily be related to or similar to the overpressure that is produced in the vertically clamped glass tube of appellant's method or the vertically clamped tube in the case of Ritt, which cannot be so large that the glass tube is blown out or deformed in ways that are undesirable during thermal processing.

It is respectfully submitted that one skilled in the art would not combine the disclosures of Schul with those of Ritt and Bennett to obtain the method as claimed in claims 36 and 42 for the above reasons.

For the foregoing reasons Honorable Board of Patent Appeals and Interferences is respectfully requested to overturn the rejection of claims 36 to 39 and 42 as unpatentable under 35 U.S.C. 103 (a) under 35 U.S.C. 103 (a) over Ritt, et al, in view of Bennett, et al, and Schul.

E. CLAIMS 43 AND 44

The issue considered in this part of the argumentation section is whether or not claims 43 and 44 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al, in view of Ott, et al.

The primary difference between the method claimed in claim 43 and that claimed in appellant's claim 32 is that the glass tube according to claim 43 is limited to a glass composition consisting of 75 wt. % SiO_2 , 10.5 wt. % B_2O_3 , 5 wt. % Al_2O_3 , 7 wt. % Na_2O , 1.5 wt. % CaO and $<< 1$ wt. % BaO . The sodium oxide release from a glass bottle, which was made by the appellant's method in which an overpressure is present during thermal processing, was measured and the results are disclosed on pages 9 and 10 of the appellant's specification. The sodium oxide release from a commercially obtained glass bottle, which was made by a method in which an overpressure was not used, was also measured and the results were compared. The comparison shows that the claimed method with the overpressure

provides unexpected improvements that should overcome any case of *prima facie* obviousness based on a combination of Ritt and Ott as will be shown in the following argumentation.

The subject matter disclosed in Ritt was described above in connection with section C and the rejection of claim 32 under 35 U.S.C. 103 (a). Ritt does not disclose producing the overpressure during thermal processing by insertion of a stopper in the upper open end of a vertically clamped glass tube that is thermally processed in its lower region.

Ott, et al, merely discloses a borosilicate glass of the composition as claimed in step a of claim 43, but does **not** disclose anything related to methods of making a bottle or a vial from this borosilicate glass. Ott, et al, certainly do not teach or provide any reason that one skilled in the art would use a stopper to produce the overpressure during thermal processing instead of forming the dot-shaped opening in the vicinity of the upper closed end of the tube with the closed ends of Ritt.

There must be a sufficient reason articulated in the Office Action that explains why one skilled in the art would arrive at the claimed method of the appellant with all its limitations. For example, the Board of Appeals has previously said that:

"The Examiner has not articulated a sufficient reason why one skilled in the art would have modified [the art] and arrived at the presently claimed subject matter" *Ex Parte Penhasi*, BPAI Appeal No. 2007-2543 (Dec 13, 2007).

and overturned the rejection in the case of the cited appeal.

The step of partially closing an opening, such as the dot-shaped opening of Ritt, in the glass tube during thermal processing by inserting the stopper according to step e of claim 43 is completely absent from the disclosure of Ritt.

Alternatively it is respectfully submitted that the method of producing the overpressure during thermal processing with the stopper according to claim 43 is not equivalent to the method of producing the overpressure with the dot-shaped opening, for the reasons set forth above in section C. The appellant's method allows the stopper to be reused for a number of glass bottles and consumes less energy and requires less effort than the corresponding method of Ritt.

Thus a case of *prima facie* obviousness of claims 43 and 44 is not established by the combined disclosures of Ritt and Ott.

However assuming for the purposes of argument that a case of *prima facie* obviousness of claims 43 and 44 is established by the combined disclosures of Ritt and Ott, the comparative experimental results disclosed on pages 9 and 10 of the appellant's specification, which show that the use of the overpressure in the glass tube during thermal processing to produce a glass bottle reduces the sodium borate deposit on the interior surfaces of the glass bottle by a factor of about 2.

According to M.P.E.P. 716 the objective evidence of non-obviousness must be fairly considered and given weight during examination. The evidence on pages

9 and 10 of appellant's specification is certainly presented in a timely manner since it was present in the originally filed specification.

The experimental evidence is not qualitative in nature, but is based on quantitative measurements.

In accordance with M.P.E.P. 716.02 the superiority of a property, the amount of a sodium borate deposit on the inner surface of the bottle or vial, has been shown by the data on pages 9 and 10 of the specification.

These experimental results are not predictable from the prior art because one skilled in the art would not predict that a sufficient overpressure would be developed merely by insertion of a stopper with a through-going opening in the upper open end of the tube that is thermally processed to make a glass bottle.

Furthermore the scope of the claiming in claims 43 and 44 has been limited to the tested glass composition on page 9 of the specification in accordance with M.P.E.P. 716.02 (d).

Thus the quantitative comparative experimental results on pages 9 and 10 of appellant's specification should overcome any case of *prima facie* obviousness allegedly established by Ritt and Ott.

For the foregoing reasons Honorable Board of Patent Appeals and Interferences is respectfully requested to overturn the rejection of claims 43 to 44 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al, in view of Ott, et al.

F. CLAIMS 45 AND 46

The issue considered in this part of the argumentation section is whether or not claims 45 and 46 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al, in view of Ott, et al, and Schul.

The primary difference between the method claimed in claim 45 and that claimed in appellant's claim 32 is that the glass tube according to claim 45 is limited to a glass composition consisting of 75 wt. % SiO_2 , 10.5 wt. % B_2O_3 , 5 wt. % Al_2O_3 , 7 wt. % Na_2O , 1.5 wt. % CaO and < 1 wt. % BaO . The sodium oxide release from a glass bottle, which was made by the appellant's method in which an overpressure is present during thermal processing, was measured and the results are disclosed on pages 9 and 10 of the appellant's specification. The sodium oxide release from a commercially obtained glass bottle, which was made by a method in which an overpressure was not used, was also measured and the results were compared. The comparison shows that the claimed method with the overpressure provides unexpected improvements that should overcome any case of *prima facie* obviousness based on a combination of Ritt, Ott, and Schul as will be shown in the following argumentation.

The subject matter disclosed in Ritt was described above in connection with sections C and D and the rejection of claim 36 under 35 U.S.C. 103 (a). Ritt does not disclose producing the overpressure during thermal processing of a vertically

oriented tube by blowing a gas in the upper open end of the vertical glass tube that is thermally processed in its lower region to make the glass bottle.

Ott merely discloses a borosilicate glass of the composition as claimed in step a of claim 45, but does **not** disclose anything related to methods of making a bottle or a vial from this borosilicate glass. Ott certainly would not teach or provide any reason that one skilled in the art would use a stopper to produce the overpressure during thermal processing instead of forming the dot-shaped opening in the vicinity of the upper closed end of the tube with the closed ends of Ritt.

The disclosures of Schul and their relationship to the claimed invention and the cited prior art have been discussed above in section D. The argumentation in section D regarding Schul is applicable in the case of the present rejection and is incorporated here by explicit reference thereto.

Briefly one skilled in the art of making glass bottles from a glass tube made of conventional aluminoborosilicate glass would not combine the disclosures of Schul with those of Ritt and Ott in the manner suggested in the final Office Action. Schul discloses a method for making fused silica tubes of a precisely determined inner diameter from a hollow silica cylinder. The silica tubes of Schul with the calibrated inner diameters are made under entirely different conditions of temperature and the like so that one would not be able to reasonably predict that the measures used to pressurize the hollow silica cylinder of Schul to make precisely calibrated silica tubes would be helpful in making glass bottles with less surface contamination.

One skilled in the arts only has the disclosures in the prior art as represented by the cited references, Ritt, Bennet, and Schul, available at the time the claimed invention was made. Knowledge that is gained from the appellant's specification cannot be combined under 35 U.S.C. 103 (a) with these prior art references to arrive at the claimed invention. For example, the Federal Courts have said:

"As in all determinations under 35 U.S.C. 103, the decision-maker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selected elements from references to fill the gaps". *In re Gorman*, 18 U.S.P.Q.2d 1885 (Fed. Cir. 1991).

The purposes and experimental conditions of Schul and those in Ritt and Ott are sufficiently different so that one skilled in the art would not combine Schul with Ritt and Ott to under 35 U.S.C. 103 (a) for the reasons set forth above.

Thus a case of *prima facie* obviousness of claims 45 and 46 is not established by the combined disclosures of Ritt, Ott, and Schul.

However assuming for the purposes of argument that a case of *prima facie* obviousness of claims 45 and 46 is established by the combined disclosures of Ritt, Ott, and Schul, the comparative experimental results disclosed on pages 9 and 10 of the appellant's specification, which show that the use of the overpressure in the glass tube during thermal processing to produce a glass bottle reduces the sodium borate deposit on the interior surfaces of the glass bottle by a factor of about 2.

According to M.P.E.P. 716 the objective evidence of non-obviousness must be fairly considered and given weight during examination. The evidence on pages 9 and 10 of appellant's specification is certainly presented in a timely manner since it was present in the originally filed specification.

The experimental evidence is not qualitative in nature, but is based on quantitative measurements.

In accordance with M.P.E.P. 716.02 the superiority of a property, the amount of a sodium borate deposit on the inner surface of the bottle or vial, has been shown by the data on pages 9 and 10 of the specification.

These experimental results are not predictable from the prior art because one skilled in the art would not predict that a sufficient overpressure would be developed merely by insertion of a stopper with a through-going opening in the upper open end of the tube that is thermally processed to make a glass bottle.

Furthermore the scope of the claiming in claims 45 and 46 has been limited to the tested glass composition on page 9 of the specification in accordance with M.P.E.P. 716.02 (d).

Thus the quantitative comparative experimental results on pages 9 and 10 of appellant's specification should overcome any case of *prima facie* obviousness allegedly established by Ritt, Ott, and Schul.

For the foregoing reasons Honorable Board of Patent Appeals and Interferences is respectfully requested to overturn the rejection of claims 45 to 46 are unpatentable under 35 U.S.C. 103 (a) over Ritt, et al, in view of Ott, et al, and Schul.

VIII. APPENDIX OF CLAIMS

A clean copy of the pending claims on appeal follows herein below.

32. A method of making a small glass container, said method comprising the steps of:

a) clamping a hollow glass tube with an open upper end and an inner surface in a vertical orientation, said hollow glass tube having an alkali release during thermal processing of the hollow glass tube;

b) thermally cutting said hollow glass tube clamped in said vertical orientation in step a) to length, thereby forming a tube piece for discard and a bottom of said hollow glass tube clamped in said vertical orientation in step a);

c) thermally opening said bottom of said hollow glass tube formed in step b) by heating said bottom; and

d) partially closing said open upper end of said hollow glass tube with a stopper provided with a through-going opening, wherein said through-going opening is dimensioned so that an overpressure is produced by constricting a gas flow path through said open upper end during said thermal processing, but so that said open upper end is kept sufficiently open so that an excessive overpressure that would otherwise damage the glass tube is not produced, said thermal processing including said thermally cutting to length and said thermally opening said bottom;

whereby contamination of said inner surface by said alkali release during said thermal processing is at least reduced.

33. The method as defined in claim 32, wherein said alkali release from said inner surface during said thermal processing and said thermal processing takes place by heating with flames and/or with jet flames.

34. The method as defined in claim 32, further comprising forming a container mouth at said bottom of said hollow glass tube and subsequently melting through said hollow glass tube clamped in said vertical orientation at a position corresponding to a height of said small glass container in order to form said small glass container.

35. The method as defined in claim 32, wherein said small glass container is a bottle or an ampoule.

36. A method of making a small glass container, said method comprising the steps of:

a) clamping a hollow glass tube with an open upper end and an inner surface in a vertical orientation, said hollow glass tube having an alkali release during thermal processing of the hollow glass tube;

b) thermally cutting said hollow glass tube clamped in said vertical orientation in step a) to length, thereby forming a tube piece for discard and a bottom of said hollow glass tube clamped in said vertical orientation in step a);

c) thermally opening said bottom of said hollow glass tube formed in step b) by heating said bottom; and

d) blowing gas into the hollow glass tube through said open upper end of said hollow glass tube and through the hollow glass tube so that an overpressure is produced during said thermal processing of said hollow glass tube, said thermal processing including said thermally opening said bottom and said thermally cutting to length;

so that contamination of said inner surface of said hollow glass tube by said alkali release during thermal processing is at least reduced.

37. The method as defined in claim 36, wherein said alkali release during said thermal processing and said thermal processing takes place by heating with flames and/or with jet flames.

38. The method as defined in claim 36, further comprising forming a container mouth at said bottom of said hollow glass tube and subsequently melting through said hollow glass tube clamped in said vertical orientation at a position corresponding to a height of said small glass container in order to form said small glass container.

39. The method as defined in claim 36, wherein said small glass container is a bottle or an ampoule.

40. A method of at least reducing contamination of an inner surface of a hollow glass tube by an alkali release during thermal processing, said hollow glass tube having an open upper end and an inner surface, said method comprising the steps of:

a) clamping said hollow glass tube with said open upper end and said inner surface in a vertical orientation, said hollow glass tube having an alkali release during said thermal processing of said hollow glass tube; and

b) partially closing said open upper end of said hollow glass tube clamped in said vertical orientation in step a) with a stopper provided with a through-going opening, wherein said through-going opening is dimensioned so that an overpressure is produced by constricting a gas flow path through said open upper end during said thermal processing, but so that said open upper end is kept sufficiently open so that an excessive overpressure that would otherwise damage the glass tube is not produced, said thermal processing including said thermally cutting to length and said thermally opening said bottom;

whereby said contamination of said inner surface of said hollow glass tube by said alkali release during said thermal processing is at least reduced because of said overpressure produced in said hollow glass tube.

41. The method as defined in claim 40, further comprising thermally cutting said hollow glass tube clamped in said vertical orientation to length, thereby forming a tube piece for discard and a bottom of said hollow glass tube clamped in said vertical orientation and then thermally opening said bottom of said hollow glass tube by heating said bottom.

42. A method of at least reducing contamination of an inner surface of a hollow glass tube by alkali compounds evaporating during thermal processing, said hollow glass tube having an open upper end and an inner surface, said method comprising the steps of:

- a) clamping said hollow glass tube with said open upper end and said inner surface in a vertical orientation, said hollow glass tube having an alkali release during said thermal processing of said hollow glass tube;

- b) thermally cutting said hollow glass tube clamped in said vertical orientation in step a) to length, thereby forming a tube piece for discard and a bottom of said hollow glass tube clamped in said vertical orientation in step a);

- c) thermally opening said bottom of said hollow glass tube formed in step b) by heating said bottom; and

- d) producing an overpressure in said hollow glass tube by blowing gas into the hollow glass tube through said open upper end of said hollow glass tube and through said hollow glass tube during said thermal processing of said hollow glass tube, said thermal processing including said thermally opening said bottom and said thermally cutting to length;

so that contamination of said inner surface of said hollow glass tube by said alkali release during thermal processing is at least reduced because of the overpressure produced in said hollow glass tube during said thermal processing.

43. A method of making a small glass container, said method comprising the steps of:

a) providing a glass tube with an open upper end and an inner surface, said glass tube consisting of glass with a composition, in percent by weight on an oxide basis, of SiO₂, 75; B₂O₃, 10.5; Al₂O₃, 5; Na₂O, 7; CaO, 1.5; and BaO, << 1;

b) clamping said glass tube with said open upper end and said inner surface in a vertical orientation;

c) thermally cutting said glass tube clamped in said vertical orientation in step b) to length, thereby forming a tube piece for discard and a bottom of said glass tube clamped in said vertical orientation in step b);

d) thermally opening said bottom of said glass tube formed in step c) by heating said bottom; and

e) partially closing said open upper end of said glass tube with a stopper provided with a through-going opening, wherein said through-going opening is dimensioned so that an overpressure is produced by constricting a gas flow path through said open upper end during thermal processing of said glass tube in which sodium borate evaporates and deposits on said inner surface, but so that said open upper end is kept sufficiently open so that an excessive overpressure that

would otherwise damage the glass tube is not produced, said thermal processing including said thermally opening of said bottom and said thermally cutting to length; whereby contamination of said inner surface by said sodium borate deposited on said inner surface during thermal processing is at least reduced.

44. The method as defined in claim 43, further comprising forming a container mouth at said bottom of said hollow glass tube clamped in said vertical orientation and subsequently melting through said hollow glass tube clamped in said vertical orientation at a position corresponding to a height of said small glass container in order to form said small glass container.

45. A method of making a small glass container, said method comprising the steps of:

a) providing a glass tube with an open upper end and an inner surface, said glass tube consisting of glass with a glass composition, in percent by weight on an oxide basis, of SiO_2 , 75; B_2O_3 , 10.5; Al_2O_3 , 5; Na_2O , 7; CaO , 1.5; and BaO , < 1 ;

b) clamping said glass tube with said open upper end and said inner surface in a vertical orientation;

c) thermally cutting said glass tube clamped in said vertical orientation in step b) to length, thereby forming a tube piece for discard and a bottom of said glass tube clamped in said vertical orientation;

d) thermally opening said bottom of said glass tube formed in step c) by heating said bottom; and

e) blowing gas into said glass tube through said open upper end and through said glass tube and through said glass tube so that an overpressure is produced during thermal processing of said glass tube in which sodium borate evaporates and deposits on said inner surface during said thermal processing, said thermal processing including said thermally opening said bottom and said thermally cutting to length;

whereby contamination of said inner surface of said hollow glass tube by depositing of said sodium borate on said inner surface is at least reduced.

46. The method as defined in claim 45, further comprising forming a container mouth at said bottom of said hollow glass tube clamped in said vertical orientation and subsequently melting through said hollow glass tube clamped in said vertical orientation at a position corresponding to a height of said small glass container in order to form said small glass container.

IX. EVIDENCE APPENDIX

Comparative experimental evidence that shows that glass containers made by the method according to the claimed invention were surprisingly contaminated less by deposition of alkali compounds on their inner surface appears in a single paragraph on page 9, line 14, to page 10, line 2, of appellant's originally filed specification.

This paragraph is quoted here as follows:

"A glass tube made from FIOLAX®-clear (product of SCHOTT) is used as the glass tube 2. Its chemical composition is 75 percent by weight SiO_2 , 10.5 percent by weight B_2O_3 , 5 percent by weight Al_2O_3 , 7 percent by weight Na_2O , 1.5 percent by weight CaO and $\ll 1$ percent by weight BaO . The resulting glass bottle has a sodium borate coating on its inside because of the thermal processing. If one determines the Na_2O release according to ISO 4802-2, the result for the glass bottles made according to the invention is 1.31 mg/l Na_2O on average. For comparison glass bottles made commercially, i.e. without an overpressure were also measured. The Na_2O release from these latter glass bottles is 2.42 mg/l on average. Thus the bottles made according to the invention produce a 54 % lower Na_2O release than those obtained commercially."

This quantitative evidence of unexpectedly reduced sodium borate contamination of the inner surfaces of the bottles made with the FIOLAX® glass

was entered in the record when the originally filed specification was entered. It is especially relevant to method claims 43 to 46, which are of comparable scope to the scope of the evidence in accordance with M.P.E.P. 716.02 (d). Method claims 43 to 46 are limited to a glass that has the same composition as the FIOLAX® glass described in the paragraph on page 9, line 14, to page 10, line 2.

X. RELATED PROCEEDINGS

NONE

XI. SIGNATURE

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,



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